over it, it is laid down again in a reversed position, the plate being inked again if necessary, and passed through the press once more. Care must be taken not to allow the ink to stain the back of the prints, the paper backing being changed as often as necessary.

If a press is not available, or in cases where the work is fine, or the gelatine thin, the transfer print may be inked by hand, using an india-rubber or glue roller, or a dabber made of roller composition, a piece of sponge or cotton, or a brush.

The transfer is pinned on to a board, or, as recommended by Mr. Bolas, clamped down on a piece of plate-glass by four strips of metal or wood and some American clips; this method has the advantage that the progress of the inking and the uniformity of the coating can be examined from time to time by looking through the glass.

When using a hand roller, a softish ink, containing little varnish, should be used, otherwise the roller will catch the gelatine surface, making the inking difficult, and perhaps raising blisters.

Mr. Bolas recommends a solution of equal parts of typographic ink and middle lithographic varnish in sufficient oil of turpentine to give it the consistence of cream. A piece of muslin being placed over the mouth of the bottle containing it, a few drops are filtered out on to the inking slab. This ink is applied to the transfer print with a dabber made of rag, or of the composition used for printing-rollers, taking care to get a very thin and uniform coating, working down thick and uneven places till they are the same as the rest of the film. If necessary, a little turpentine may be added to the ink on the slab from time to time, and should the coating of ink get hopelessly lumpy or uneven, it may be washed off with a little turpentine, and inked in again. Care must be taken throughout that no ink falls on the back of the paper.

For use with his double-coated paper, Husnik recommends the following:—

Finest printing ink	...	...	20	parts
Wax ...	...	...	50	,,
Tallow ...	...	...	40	,,
Resin ...	...	...	35	,,
Turpentine...	...	...	310	,,
Fine Berlin blue	...	...	30	,,

or one-sixth part of wax added to ordinary retransfer ink, and dissolved in turpentine to the consistence of oil. These inks are applied to the transfer print with a tuft of cotton, up and down and across, in even, parallel strokes, until the print acquires a uniform dark grey colour.

An ink ready prepared by Husnik is also found in commerce.

Washing the Transfer Print.—Having by any of the above methods obtained an even coating of ink, the print has next to be washed to remove the superfluous ink, and so bring out and develop the image.

If the transfer paper is prepared with soluble gelatine, and inked in the press, it will be desirable to use warm water to dissolve and remove the superfluous gelatine. In other cases, cold water may be used.

It has generally been recommended, in working the Southampton process, to lay the inked transfers, face uppermost, on trays containing water at about 90° F., until the soluble gelatine swells sufficiently to make the details of the image clearly visible as shiny patches on a matt black ground. This, however, is not essentially necessary; and in doing large numbers of transfers, we generally allow them to soak for a short time in tepid water till the ink is well loosened. They are then laid, face upwards, on a sloping plate of glass or metal, and gently washed with a soft sponge under a running stream of warm water, until all the superfluous ink and gelatine have been removed, and the image appears clear.

If the paper is fresh, and the print made from a good negative, with sufficiently opaque ground and clear lines, the unaltered gelatine, with the ink on its surface, will wash away with the greatest readiness; but if the paper be rather old, or the negative thin in parts, so that the ink does not clear away readily, it will be advisable to allow the prints to soak for a short time in rather warmer water, and then wash again.

It may be noted that once the transfer prints have been thoroughly wetted or immersed in water, the windows may be opened, and the washing done by daylight. It is sometimes recommended to use warm gum water for washing off the ink, but it is not necessary. In washing the transfers, the sponge must be kept full of water, so as to ensure a constant flow over the surface of the print to wash off the ink as soon as it becomes disengaged; if allowed to rest on the paper after the removal of the gelatine, it is liable to cause stains. The sponge must be used with a very light hand, so as not to remove the finer lines; and if a little scrubbing is necessary, as it sometimes is, to remove the ink in faulty parts of the print, it must be done with caution.

Transfer prints on Husnik's paper, or papers prepared with gum, albumen, or insoluble gelatine, may be washed off in cold water with a soft sponge or brush.

Mr. Bolas recommendes the print to be soaked in cold water for ten minutes, and then softly brushed with a broad camel's hair brush, keeping a constant stream of water flowing over the paper. As the ink becomes loosened, some of it will tend to attach itself to the broader and darker lines, while the fine lines will retain their original thickness, and therefore, in inking the transfer print, this tendency must be allowed for, and the thickness of the coating of ink regulated by the requirements of the finest lines. Should the print not clear easily under the brush, it may be soaked for a while in slightly warm water.

When the transfers are perfectly clean, they are finally well rinsed front and back in clean cold water, and hung up to dry; or they may be carefully blotted off with blotting-paper, and either dried, or, when they have reached the proper stage of dampness, transferred at once.

Husnik recommends that the transfers should be exposed to the light for a time after drying, in order that the white parts may lose their stickiness. This may also be brought about by soaking the prints for a couple of minutes in a solution of tannin at 1 to 100. After draining, the prints are blotted off and transferred while damp.

When the transfer print is dry, the image should appear quite clear, the lines sharply defined, and the ground free from ink. It constantly happens that parts which appeared quite clean while washing will be found covered with a scummy coating of ink, or ragged particles of ink will be found between the lines. The cause of this is insufficient washing, and it requires some little experience to detect the presence of ink on the swollen and partially insoluble gelatine. This defect can generally be remedied with a sponge and warm water.

APPROXIMATIVE PHOTOMETRIC MEASUREMENTS OF SUN, MOON, CLOUDY SKY, AND ELECTRIC AND OTHER ARTIFICIAL LIGHTS.*

Sir William Thomson pointed out that the light and heat perceived in the radiations from hot bodies were but the different modes in which the energy of vibration induced by the heat was conveyed to our consciousness. A hot kettle, red-hot iron, incandescent iron, platinum, or carbon, the incandescence in the electric arc, all radiate energy in the same manner, and according as it perceived through the sense of sight, by its organ, the eye, or by the sense of heat,† we speak of it as light or heat. When the period of vibration is longer than one four-hundred-

* From *Nature*. Abstract of a Lecture by Sir W. Thomson, delivered at the Glasgow Philosophical Society.

† Sometimes wrongly called the sense of touch. The true list of the senses, first given, I believe, by Dr. Thomas Reid, makes two of what used to be called the sense of touch, so that, instead of the still too common wrong-reckoning of five senses, we have six, as follows:—Sense of force; sense of heat; sense of sound; sense of light; sense of taste; sense of smell.

SLUB Wir führen Wissen. HGB Hochschule für Grafik und Buchkunst Academy of Fine Arts Leipzig